

Remarks

I. Status of claims

Claims 13-23 were pending. Claim 24 has been added

Claims 13, 22, and 23 have been amended and claim 21 has been canceled without prejudice.

II. Claim rejections under 35 U.S.C. § 102

A. Claim rejections over Uchiya

The Examiner has rejected claims 13, 16-19, and 21-23 under 35 U.S.C. § 102(b) over Uchiya (U.S. 5,258,608).

1. Independent claim 13

Claim 13 has been amended and now recites that the color filter array comprises an array of color filters each disposed over a respective light sensing element, wherein light travels from each color filter to a respective light sensing element through a respective light transmission path substantially transmissive to radiation in a visible wavelength range. Claim 13 also recites that the bottom antireflection coating is disposed in each light transmission path between the color filter array and the active image sensing device structure.

In Uchiya's imaging device, the aluminum layers 4 are not substantially transmissive to radiation in a visible wavelength range (see, e.g., col. 4, lines 11-15, and FIG. 4). Accordingly, in Uchiya's imaging device, the only light transmission paths that are located between the color filters 11, 15, 19 and the optoelectrical conversion regions 2 and that are substantially transmissive to radiation in a visible wavelength range, are the light transmission paths defined between adjacent aluminum layers 4. Since, the antireflection layers 5, 6 in Uchuya's imaging device exist only on top of the aluminum layers 4, these antireflection layers 5, 6 are *not* "disposed in each light transmission path between the color filter array and the active image sensing device structure," as now recited in claim 13.

For at least these reasons, the Examiner's rejection of independent claim 13 under 35 U.S.C. § 102(b) over Uchiya now should be withdrawn.

2. Claims 16-19 and 21-23

Claim 21 has been canceled without prejudice.

Claims 16-18, 19 and 21-23 incorporate the features of independent claim 13 and therefore are patentable for at least the same reasons explained above. Claims 16, 19, 22, and 23 are patentable for the following additional reasons.

Claim 16 recites that the bottom antireflection coating has a thickness selected to improve an optical transmission characteristic of one or more colors of the color filter array. The Examiner has asserted that the layers 5, 6 in Uchiya's imaging device have a thickness selected to improve an optical transmission characteristic of one or more colors of the color filter array. As explained above, however, in Uchiya's imaging device the antireflection layers 5, 6 are *not* disposed in any light transmission path between the color filters 1, 15, 19 and the optoelectrical conversion regions 2. Accordingly, there is no way for the layers 5, 6 to improve an optical transmission characteristic of one or more colors of the color filter array, no matter what thicknesses are selected for the layers 5, 6.

Claim 19 recites that the bottom antireflection coating has a substantially higher plasma etch rate than the color filter array. Uchiya fails to teach or suggest any specific composition for the color filters 11, 15, 19 and, therefore, it is not possible to determine whether the layers 5, 6 have a substantially higher plasma etch rate than the colors filters 11, 15, 19. In addition, Uchiya does not teach or suggest anything that would have led one of ordinary skill in the art at the time of the invention to select a bottom antireflection coating that has a substantially higher plasma etch rate than a color filter array, as recited in claim 19.

Claim 22 recites that the bottom antireflection coating has a thickness of about 60 nm. The Examiner has asserted that "the bottom antireflection coating, (Figure 1E#5 & 6 and Col. 3, Lines 20), has a thickness of about 60 nm, (Col. 3 Lines 24-25)." Uchiya, however, clearly teaches that layer 5 has a thickness of 100 nm (col. 2, lines 61 and 62) and that layer 6 has a thickness of 30 nm (col. 2, line 65). Therefore, the combined thickness of layers 5, 6 is 130 nm, which is *not* about 60 nm.

Claim 23 has been amended and now recites that the bottom antireflection coating is present only in regions directly under color filter array material. FIG. 1E of Uchiya clearly shows that layers 5, 6 are present in regions not directly under color filter array material.

For at least these additional reasons, the Examiner's rejection of claims 16, 18, 19, 22, and 23 under 35 U.S.C. § 102(b) over Uchiya should be withdrawn.

B. Claim rejections over Lin

The Examiner has rejected claims 13 and 20 under 35 U.S.C. § 102(b) over Lin (U.S. 6,242,730).

Claim 13 has been amended and now recites that the bottom antireflection coating has a thickness less than approximately 200 nm. The Examiner has asserted that Lin's spin-on-glass (SOG) layer 306 constitutes an antireflection coating. Lin, however, teaches that "[i]n order to obtain a desired thickness and uniformity of the [SOG] 306, it is necessary to spin coat SOG 306 to a thickness of 2000 angstroms, twice" (col. 3, lines 50-52). That is, Lin clearly teaches that the SOG layer 306 must have a thickness of 400 nm.

For at least these reasons, the Examiner's rejection of independent claim 13 under 35 U.S.C. § 102(b) over Lin now should be withdrawn.

Claim 20 incorporates the features of independent claim 13 and therefore is patentable for at least the same reasons explained above.

III. Claim rejections under 35 U.S.C. § 103

A. Claim rejection over Uchiya

The Examiner has rejected claim 15 under 35 U.S.C. § 103(a) over Uchiya.

Claim 15, however, incorporates the features of independent claim 13 and therefore is patentable for at least the same reasons explained above.

Applicant : Duane Fasen et al.
Serial No. : 09/938,394
Filed : August 23, 2001
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Attorney's Docket No.: 10004405-1
Amendment dated September 16, 2003
Reply to Office action dated June 19, 20003

B. Claim rejection over Uchiya and Dixit

The Examiner has rejected claim 15 under 35 U.S.C. § 103(a) over Uchiya in view of Dixit (U.S. 6,106,995).

Claim 14 incorporates the features of independent claim 13. Dixit does not make up for Uchiya's failure to teach or suggest a bottom antireflection coating that is disposed in each light transmission path between the color filter array and the active image sensing device structure. Therefore, claim 14 is patentable for at least the same reasons explained above.

IV. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

Respectfully submitted,

Date: September 16, 2003



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